

Continual monitoring has led to the development of a loose housing facility

Ian & Karen Litchfield – Mayrung, southern Riverina, NSW – December 2023



Overview

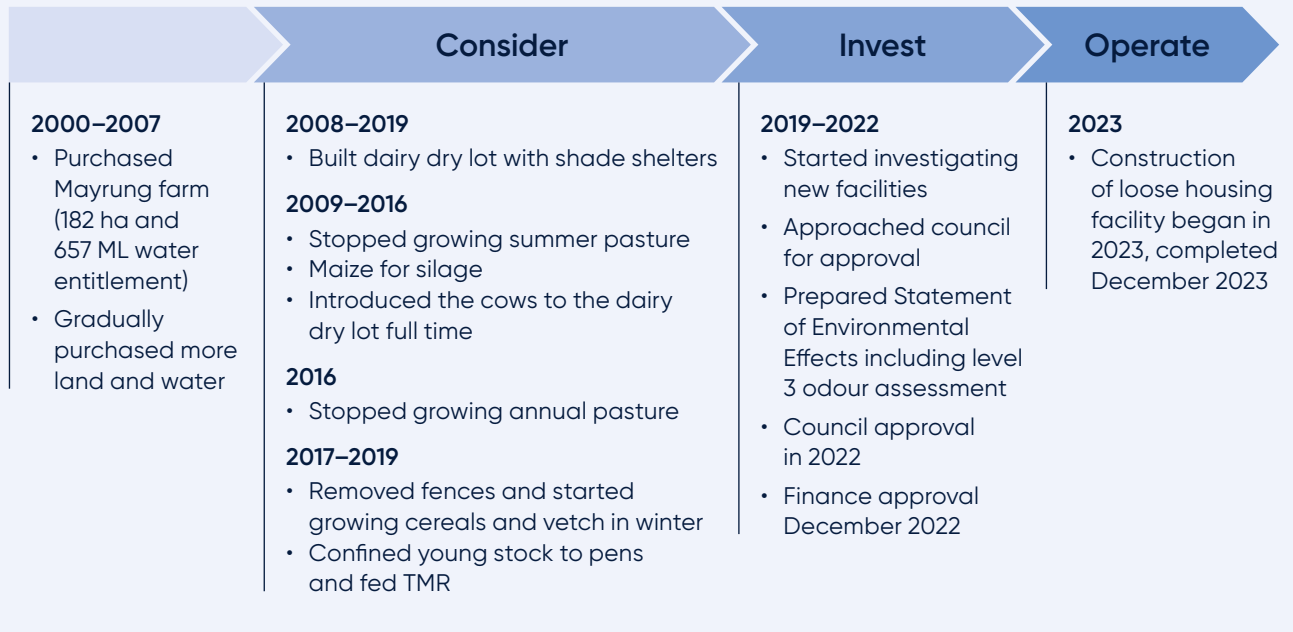
An investment in a loose housing facility with a compost bedded pack is the outcome of continuous improvement and refinement of the business by Ian and Karen Litchfield. Since 2000, they have expanded their herd from 170 milking cows to over 1,000 in 2023.

Their meticulous attention to detail and commitment to continuous improvement has resulted in increased efficiencies, enhanced performance and overall business growth. They have been responsive and adaptive to various challenges, including the 2007 drought, low irrigation water availability and fluctuating weather conditions. Consistently, they have reviewed and evaluated their farming operation, analysing their business to pinpoint problems, gaps and opportunities. They have prioritised a commitment for cow comfort,

reducing feed wastage and improving irrigation water use efficiency. Focused efforts in these areas have preceded any development or expansion, reflecting their proactive approach to business enhancement.

Their disciplined business monitoring has instilled confidence in their investments. Transitioning from a pasture-based system to zero-grazing in a dairy dry lot, and most recently to a loose housing (compost bedded pack) facility. Litchfield's adeptness in embracing intensive dairy systems reflects their business resilience and adaptability and positions them well for continued growth and succession in the evolving landscape of dairy farming in southern NSW.

Timeline



History

Ian and Karen purchased their first property in Mayrung in 2000, starting with 170 cows in an existing herringbone dairy. The 182 ha property was operated as a traditional pasture-based dairy farm with annual and perennial ryegrass pastures. In 2007, they invested in a new rotary dairy to expand the herd due to the risks associated with a pasture-based system, especially during droughts.

After a trip to the United States of America in 2007, they built a dairy dry lot with an earthen pad and shade shelters in 2008 to allow for more efficient feeding of cows through the summer (less feed wastage, improved cow comfort and more efficient use of irrigation water). The dairy dry lot system evolved over the years, with a shift from TMR feeding and modifications to address challenges. In 2019, the Litchfield's assessed options for further intensification, leading to construction of a loose housing facility.

Consider phase

The dairy dry lot transitioned their feeding system to TMR

The process of transitioning to a TMR system took a number of years to achieve and required changes to work routines and operating procedures. The key features of moving to zero-grazing were:

- One herd to 4 herds as cows were penned in smaller groups according to high and low production A1 and A2 herds (max 250 cows per pen).
- Batch (spring and autumn) calving to calving all year round using Allflex cow monitoring system and sexed semen. Days in milk have reduced to between 160 to 170 days.

- Feeding a partial mixed ration (PMR) plus grazing to feeding a TMR in troughs. TMR feeding is monitored using TMR Tracker to ensure accurate loading of the mixer and consistent feeding of cows.
- Milking routine now includes droving of herds and grooming of pens. A teat scrubber was introduced to improve udder health and cell count and an auto teat spray is used at cups off.
- All young stock now reared on TMR.

The dairy dry lot system had its drawbacks. It was never designed to house cows all year round. The dairy dry lot became wet and bogging during winter which increased the mastitis cases, reduced cow comfort and milk production.

They also had issues with the feed troughs. The J troughs resulted in increased feed waste. More mixes were required per day, as full troughs resulted in higher rates of wastage. The trough feeding also often led to a slight under feeding of cows as they are encouraged to eat all available feed before more feed is offered (difficult to clean). Without a concrete alley, the cows were unable to be cooled at the feed face and overcrowding under the shade shelter resulted in heat stress.

While the dairy dry lot served its purpose, the Litchfield's continual monitoring suggested that further changes to the feeding system would enhance their business. They understood that improved facilities would reduce milk production fluctuations in the wet winter and hot summer months. Milk production could also increase with a smaller percentage of refusals leading to increased dry matter intake.

Invest Phase

Various housing options investigated and evaluated

Their bank at the time was consulted but showed little interest in supporting the development to a loose housing facility. They visited intensive farms both locally and in the United States of America on a number of occasions to ensure they were making the right decision. All housing options were considered, including a freestall with sand bedding, however they settled on a loose housing with a composted bedded pack.

The planning process for constructing the loose housing facilities

The decision was made to build a loose housing (compost bedded pack) facility with a central feed alley as this was financially achievable. Recent land and water purchases influenced their borrowing capacity and the investment in a loose housing facility fell within the lending parameters set by the bank. The Litchfield's switched to a new bank that was supportive of the development.

The next significant step was meeting council to seek development approval. The council outlined the requirements of a Statement of Environmental Effects needed for approval purposes. This included a Level 3 odour assessment and a geotechnical survey of the effluent storage area. It also included an effluent management plan, operations management plan and an animal welfare plan.

Infrastructure was designed to address shortcomings in previous facility

The infrastructure plans have been designed to remove some of the challenges faced in the dairy dry lot while enhancing cow comfort. The loose housing provides greater area of undercover loafing area per cow that will be kept drier and cleaner than the dairy dry lot. A concrete feeding alley with sprinklers to cool cows through the summer and a flood wash system will keep the alleyways clean. Fans will be added to assist with cooling cows and drying the bedding.

The central feeding alley will reduce waste compared to the troughs used in the dairy dry lot. It will also allow for better feed management at the feed face. Feed can be pushed up regularly and refusals can be removed with ease and fed to young stock.

The move to the loose housing facility will require some changes, however the Litchfield's are confident that improving cow comfort will lift milk production and reduce fluctuations brought on by extreme weather conditions.



Earthen dairy dry lot with J troughs for feeding and skillion roof to provide 4m² per cow of shade.

Operate Phase

Prior to transitioning to the loose housing facility, they have spent the last 12 years fine tuning the business. Addressing problems along the way and the transition to TMR in the dairy dry lot have positioned the Litchfield's to immediately take advantage of the benefits in the new facility. Many of the adaptations required in the loose housing have already been implemented, so the move to the new facility will likely see minimal disruptions.

- **Herd reproductive performance** – the introduction of a cow monitoring system to aid in heat detection gave them confidence to calve all year round. The result has been a decrease in days in milk, an increase in voluntary culling and a steady stream of replacement heifers by using sexed semen.
- **Heifer replacements** – heifers are reared on a TMR and joined to AI at approximately 13 months of age with the goal of calving them at 22 months. Milking the heifers 2 months earlier in the loose housing facility, compared to the dairy dry lot system where heifers were agisted for part of the year, has contributed to their strong economic performance.
- **Feeding** – While it is difficult to manage seasonal variation in silage quality, TMR Tracker has allowed them to monitor feed mixing and delivery to ensure consistency (consistent ration quality). Silage bunkers are managed to minimise waste and maximise quality.
- **Management routines** – Staff routines were altered when cows stopped grazing and moved to the drylot full time. Changing routines included daily grooming in the dry lots, harrowing under the shade sheds to provide cows with soft bedding, and penning cows in smaller herds to reduce time spent at the dairy.
- **Maternity pen** – They built a shade shelter and feeding alley for dry cows (close-up) and calving cows. This has allowed them to better monitor the calving process and manage the transition into the dairy more efficiently.
- **Teat health and mastitis** – teat scrubbers and sprays were introduced many years ago to improve milk let down and teat health and provide a consistent milking routine for cows and staff.
- **Equipment** – The change in dairy systems required an investment in new equipment including feeding, manure spreading and broadacre cropping equipment.

Business performance

Consistent business performance over the past three years is testament to the Litchfield's management, considering the challenging (wet) conditions and high-cost environment. An increase in their contracted milk price in 2023 and tight cost control have contributed to their higher return on total assets than the average of 14 TMR farms in inland NSW and northern Victoria in 2022/23. Above average labour efficiency and excellent herd reproductive performance have all contributed to their strong returns.

Physical characteristics	2020/21	2021/22	2022/23	2022/23 TMR Farms ¹
Milk production (litres)	8,688,456	9,512,883	9,614,632	7,103,000
Milk solids production (kg MS)	652,697	693,731	714,587	537,700
Milk solids per cow (kg MS/cow)	703	748	692	626
Herd size	929	928	1,033	836
Labour FTE's (Incl. imputed)	9.8	9.8	11.6	9.4
MS per FTE	66,344	71,898	61,559	57,078
Income, costs, profit and returns				
Milk price (\$/kg MS)	8.05	8.09	9.05	10.10
Gross farm income (\$/kg MS)	9.62	9.84	10.83	11.65
Feed costs (\$/kg M)	4.33	4.78	5.23	5.55
Employed labour cost (\$/kg MS)	1.08	1.06	1.09	1.43
Cost of production including inventory changes (\$/Kg MS)	7.49	7.55	8.22	9.84
Earnings before interest and tax (\$/kg MS)	2.08	1.94	2.23	2.16
Return on total assets	9.0%	7.6%	8.4%	7.5%

All dollars have been converted to 2022/23 dollar values.

¹ Average of 14 Victorian and NSW Total Mixed Ration (TMR) farms. (Source: Economics of TMR dairy feeding systems – where are the risks?).

A business review

Challenges

Increased demand for time has been a challenge in managing the new development. The time required for administration, Human Resources management and cow data monitoring have increased significantly.

Council approval was slow and costly.

The workforce has largely transitioned from backpackers to a skilled pool of permanent international workers. While this has addressed staff challenges, it has required extra investment for staff accommodation.

Risks

The greatest risks to the business are fluctuations in milk price and extreme weather (wet and dry) as they have the biggest impact on performance. The Litchfield's have actively taken steps to mitigate these risks in their business.

- **Milk price** – to manage any sudden decrease in milk price, the Litchfield's have entered longer-term fixed-price milk contracts. They are also shifting to an A2 herd on the back of well-considered and planned transition (i.e., cattle were not traded to make the transition from A1 to A2). Cows were already penned in small groups which have aided testing and separating the A1 from the A2 cows. The percentage of A2 cows is growing rapidly, as their A2 heifers are now moving into the herd.

- **Extreme weather (dry)** – they learnt during the 2007 drought that their cropping neighbours grew between 3 and 4 tonnes of dry matter per hectare without irrigation water. This prompted the Litchfield's to expand the land base to improve forage outcomes in dry weather. They also diversified their water portfolio by purchasing a property with a 300 ML deep lead bore water entitlement, guaranteeing some irrigation water when allocations were reduced to zero. They have also focused on building their feed inventory to ensure some carryover each season. Cereals are grown for silage and grain, with the option to cut the entire crop as silage in low water allocation years.
- **Extreme weather (wet)** – wet weather created challenges for the drylot facility, most noticeably in reducing milk production (15% drop in milk production in 2016 (Fig 1)). Wet conditions also increase culling from mastitis and lower forage quality at harvest. The loose housing will reduce the wet weather impacts on cows and milk production. Cow comfort will improve, cows will be cleaner and the outbreaks of mastitis will be less severe.

Opportunities

The wet conditions in 2022 had a significant impact on milk production and it took 9 months to recover the losses and return to expected production levels. The Litchfield's believe their new facility is capable of bringing consistency to future milk production by reducing the negative impacts from severe weather conditions and improving cow comfort.

Where to from here?

The family is in the process of structuring a succession plan to integrate their two daughters and their partners into the business. They have dedicated time to establish an organisational chart supported by position descriptions for family members and staff, aiming to facilitate Ian and Karen's gradual withdrawal from active involvement. Amy and Emma, the daughters, will assume responsibility for all administration processes including bookkeeping, HR management, cow data monitoring and data input. Amy's husband, Jack, who has a decade of experience within the business will oversee the cropping program and crop machinery maintenance. His responsibilities encompass manure spreading, sowing, spraying, irrigating and harvesting. Emma's husband, leveraging his experience from the Herd Improvement industry, will take the role of herd manager. Meanwhile, Ian and Karen anticipate dedicating more time caring for their grandkids, playing golf and pursuing travel opportunities.

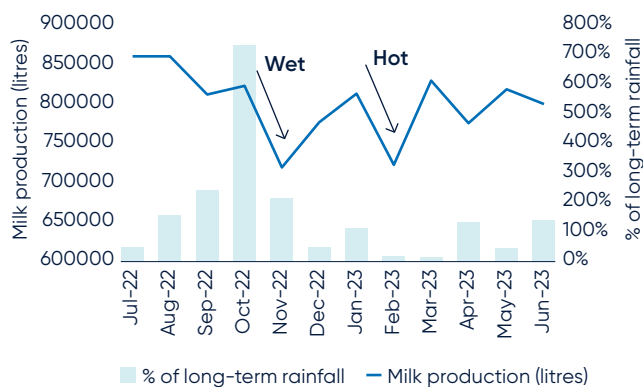


Figure 1. Lower milk production coincided with extreme wet and hot periods during 2022/23

Farm characteristics	
Effective farm size (ha)	855 ha
Milking area (ha)	0 – all cut and carry
Pasture/cropping areas (ha)	<ul style="list-style-type: none"> • Summer cropping: 150 ha maize (silage), 72ha lucerne (hay) • Winter cropping: 634 ha wheat/barley (silage with some wheat taken to grain), 96 ha vetch (silage)
Annual rainfall (mm)	419 mm
Irrigation	<ul style="list-style-type: none"> • Flood irrigation 1775 ML MIL, 300 ML bore, • 3.5 t DM/ML
Dairy type	50-unit rotary
Feed system & infrastructure	TMR 365 days of the year
Labour	11.6 FTE (incl imputed labour) 61,600 kg MS/FTE
Herd and milk production	
Milking cow numbers	<ul style="list-style-type: none"> • The farm milked 1,033 cows in 2022/23 • Calving all year round
Breed	Friesian & crossbred herd with average live weight of 675 kg
Milk production	<ul style="list-style-type: none"> • 9,614,632 litres in 2022/23 55% A2 milk • 9,644 L, 717kg MS per cow in 2022/23

For further information

Visit Dairy Australia webpage dedicated to **Intensive Farm Systems Economics**

Visit www.dairyaustralia.com.au and search 'National Guidelines Dairy Feedpads and Contained Housing'

Acknowledgement

Thank you to Ian and Karen Litchfield for agreeing to share their insights and experience.